

AMENDMENTS TO THE CLAIMS

1-29. (Cancelled)

30. (Currently Amended) A layered polymer scaffold comprising a plurality of synthetic biopolymer membranes of from 1 micron to 1 millimeter in thickness ~~which, wherein said membranes comprise at least one organized feature having at least one dimension of~~ patterned through-holes having lateral dimensions of about 10 to 100 microns, with intervening biopolymer areas having a lateral feature width of about 10 to 100 microns, wherein said scaffold is microfabricated by a process comprising:

generating an elastomer mold;

directing a synthetic biopolymer into the mold;

curing the synthetic biopolymer in the mold to form ~~at least one~~ a membrane of the plurality of synthetic biopolymer membranes, wherein said membrane comprises ~~a surface with varying topology including the at least one feature with at least one dimension of about 10 to 100 microns, wherein said at least one feature is~~ the pattern of through-holes with intervening biopolymer areas, formed from the synthetic polymer by the microfabrication process;

removing said membrane from the mold; and

~~assembling two or more of~~ laminating said membranes to provide the layered polymer scaffold.

31-33. (Cancelled)

34. (Previously Presented) The polymer scaffold of claim 30, wherein the elastomer is selected from the group consisting of a silicone polymer, a poly(dimethylsiloxane) (PDMS) and an epoxy polymer.

35-37. (Cancelled)

38. (Previously Presented) The polymer scaffold of claim 30, wherein the synthetic biopolymer is selected from the group consisting of poly(L-lactic acid; PLLA); poly(DL-lactic acid; PLA); poly(DL-lactic-co-glycolic acid); PLGA and copolymers and blends thereof.

39. (Withdrawn-Currently Amended) The polymer scaffold of claim 30, wherein said ~~method further comprising coating the cured~~ polymer scaffold is coated with a substance that

modulates cell adhesion selected from the group consisting of polysaccharides, peptides and proteins.

40. (Withdrawn) The polymer scaffold of claim 39, wherein the substances promote cell adhesion.

41. (Withdrawn) The polymer scaffold of claim 40, wherein the substance is selected from the group consisting of collagen, fibronectin, vitronectin, Arg-Gly-Asp (RGD) and Tyr-Ile-Gly-Ser-Arg (YIGSR) peptides, glycosaminoglycans (GAGs), hyaluronic acid (HA), integrins, selectins and cadherins.

42. (Withdrawn) The polymer scaffold of claim 39, wherein the substances inhibit cell adhesion.

43. (Withdrawn) The polymer scaffold of claim 42, wherein the substances comprise triblock polymers.

44. (Withdrawn) The polymer scaffold of claim 39, wherein the substances are selected from a list consisting of pluronics, surfactants, bovine serum albumin, poly hydroxyethylmethacrylate, polyacrylamide, and polymethymethacrylate.

45. (Currently Amended) The polymer scaffold of claim 30, wherein the ~~method further comprises inducing porosity~~ membranes are rendered porous by contacting the polymer synthetic biopolymer with a particulate leaching agent prior to curing the synthetic biopolymer in the mold.

46. (Previously Presented) The polymer scaffold of claim 45, wherein the particulate leaching agent is selected from the group consisting of a sugar, a salt and a protein.

47. (Cancelled)

48. (Currently Amended) The polymer scaffold of claim 30, wherein the step of ~~assembling further laminating~~ comprises attachment of the two or more cured polymer membranes to each other by applying mechanical pressure and heating.

49. (Currently Amended) ~~The~~ A composition comprising the polymer scaffold of claim 30, ~~the method further comprising contacting wherein~~ the polymer membranes are contacted with cells.

50-66 (Cancelled)

67. (Currently Amended) A layered polymer scaffold comprising a plurality of synthetic biopolymer membranes of from 1 micron to ~~1 millimeter~~ 20 microns in thickness wherein ~~at least one membrane of the plurality of synthetic biopolymer~~ said membranes is a mesh comprising open areas comprise patterned through-holes having lateral dimensions of about 10 to 100 microns, with intervening biopolymer areas, ~~the biopolymer areas~~ having a lateral feature width of about ~~40 to 100~~ 100 to 300 microns, wherein said scaffold is microfabricated by a process comprising:

generating an elastomer mold;

directing a synthetic biopolymer into the mold;

curing the synthetic biopolymer in the mold to form ~~at least one a~~ a membrane of the plurality of synthetic biopolymer membranes, wherein said membrane comprises ~~a surface with varying topology and comprises the open areas and intervening biopolymer areas having the lateral feature widths about 10 to 100 microns, wherein the at least one feature is the~~ patterned through-holes with intervening biopolymer, formed from the synthetic biopolymer by the microfabrication process;

removing said membrane from the mold; and

~~assembling two or more of~~ laminating said membranes to provide the layered polymer scaffold.

68. (Cancelled)

69. (Previously Presented) The polymer scaffold of claim 67, wherein the elastomer is selected from the group consisting of a silicone polymer, a poly(dimethylsiloxane) (PDMS) and an epoxy polymer.

70. (Previously Presented) The polymer scaffold of claim 67, wherein the synthetic biopolymer is selected from the group consisting of poly(L-lactic acid; PLLA); poly(DL-lactic acid; PLA); poly(DL-lactic-co-glycolic acid); PLGA and copolymers and blends thereof.

71. (Currently Amended) The polymer scaffold of claim 67, wherein the ~~method further comprises inducing porosity~~ membranes are rendered porous by contacting the ~~polymer~~

synthetic biopolymer with a particulate leaching agent prior to curing the synthetic biopolymer in the mold.

72. (Previously Presented) The polymer scaffold of claim 71, wherein the particulate leaching agent is selected from the group consisting of a sugar, a salt and a protein.

73. (Currently Amended) The polymer scaffold of claim 67, wherein the step of ~~assembling~~ further laminating comprises attachment of the two or more cured polymer membranes to each other by applying mechanical pressure and heating.

74. (Currently Amended) The polymer scaffold of claim 67, the ~~method further comprising~~ contacting wherein the polymer membranes are contacted with cells.

75.79 (Cancelled)

80. (New) The polymer scaffold of claim 30, wherein the through-holes are squares and wherein the intervening biopolymer membrane is in the form of lines.

81. (New) The polymer scaffold of claim 67, wherein the through-holes are squares and wherein the intervening biopolymer membrane is in the form of lines.